South Carolina Research Centers of Economic Excellence
Summary of Funded Projects
2002-03 and 2003-04

Institution	2002-03 Project Title/Description	2003-04 Project Title/Description
USC	Center for Nanostructures In Technology (1 endowed chair) The cutting edge of research in future electronics is now focusing on entirely new paradigms for electronic devices. Molecular and quantum electronics are dramatic and promising departures from conventional circuit concepts. This center focuses on state-of-the-art research leading to new devices for computing, electronics, photonics, information processing or related areas based on quantum or molecule-level systems. 2002-03 Funding: $4 Million	Polymer Nanocomposites (1 endowed chair) A new generation of plastics based on polymer nanocomposite technology will replace conventional polymers in many applications, changing the amounts of materials that will be necessary to achieve a given result, and creating entirely new applications. Among the potential improved properties are: fire retardancy, impermeability to gases, greater strength, higher temperature tolerance, and longer wear. 2003-04 Funding: $3.5 Million
USC		Hydrogen Fuel Cell Economy (1 endowed chair) This center will bring together a unique group of organizations, comprised of university, industrial and government partners and focus its efforts on fostering innovation in hydrogen storage and infrastructure, and to educate the general public in SC on the coming of the *Hydrogen Economy*, and to encourage technology transfer initiatives that arise from the research and educational efforts. Sensors. Sensors are ubiquitous in the present economy and the development of new sensors for fuel cells, medical devices, and automobiles is a growth industry. Fuels cell currently provide an economic alternative to diesel generation systems and in premium back-up power applications. 2003-04 Funding: $2.5 Million ($5 Million requested)

Institution	2002-03 Project Title/Description	2003-04 Project Title/Description
Clemson	Clemson International Center for Automotive Research (3 proposals) (3 endowed chairs) The vision for this S.C. Research Center of Economic Excellence in Automotive Engineering is "to be the premier automotive and motorsports research and educational facility in the world." 2002-03 Funding: $10 Million 2003-04 Funding: $5 Million	Vehicle Electronic Systems Integration (1 endowed chair) Research activities will be focused on vehicle electronic fundamentals, such as automotive electronics, signal and information processing, microsensors, microelectronic and mechanical systems (MEMS), electronics and sensor integration, networked microsensor technology, and on emerging applications, such as adaptive cruise control, warning systems, integrated pressure systems, inertial sensing, etc. Embedding networks of small, possibly microscopic, sensors and control elements in automobiles and trucks to perform automated monitoring and information processing could drastically enhance and revolutionize the transportation industry. 2003-04 Funding: $3 Million
Clemson		Photonic Materials (1 endowed chair) As global use of the Internet expands, with more demand for instantaneous movement of dense video, audio, and graphics files, the need for an all-optical network is continuing to grow. This market need, coupled with research successes coming from university and corporate laboratories, continues to spur demand for materials and devices used in all-optical networks, including new optical fibers, amplifiers, planar lightwave circuits, dense wavelength division multiplexers (DWDM), and backplanes. 2003-04 Funding: $5 Million

Institution	2002-03 Project Title/Description	2003-04 Project Title/Description
MUSC	Applied Marine Genomics (2 endowed chairs) This Center will develop new knowledge, innovative tools and technologies, and will educate and train students who are prepared to work in the aquaculture industry at several levels. The Center will develop and use genomics tools to produce aquatic species with increased resistance to disease and infection and will develop the science and technology to enable rapid detection of pathogens. 2002-03 Funding: $4 Million	
MUSC	Proteomics Research Center (1 endowed chair) Proteomics, the study of all of the proteins expressed in a living system, is the next frontier in biomedical research following the sequencing of the human genome. The objective of proteomics is to identify the proteins, to measure the amounts of the proteins and how the amounts change under changing circumstances, and to identify how the proteins interact functionally in the system. The earliest human health related payoff from the study of proteomics will be the identification of new disease markers and development of new diagnostic tests. Longer term payoff will be in molecular level understanding of disease processes, which will lead to new approaches to the treatment and prevention of disease. Proteomics is also critical to multiple other fields including bioterrorism defense, environmental health, marine resources, and agriculture. 2002-03 Funding: $4 Million	

Institution	2002-03 Project Title/Description	2003-04 Project Title/Description
MUSC	Center of Excellence in Neuroscience Research (3 endowed chairs) The long-term goal for the Center is to build an internationally known program in the Neurosciences, with special emphasis in the areas of Parkinson's disease, Alzheimer's disease, dementia, stroke, cerebrovascular disease, and ALS and in the creation of a biomedical science industry in South Carolina. Strong emphasis is placed on new combinations of ideas and techniques: the application of new developments in basic neuroscience to clinical problems; the use of molecular techniques to solve problems in cellular and integrative neuroscience; and the development of novel cellular and animal models of neurological and psychiatric illness. Among the highest profile research endeavors are those in the molecular biology of sensory processing, cell signaling and spinal cord function, neuroprotection and neural repair, as well as understanding the molecular basis and neural plasticity in addiction to drugs of abuse. 2002-03 Funding: $3 Million	
MUSC, USC & Clemson	SC Center for Regenerative Medicine (3 endowed chairs) Tissue engineering, often called "regenerative medicine", is the regeneration or remodeling of tissue and organs for the purpose of repairing, replacing, maintaining or enhancing organ function; and the engineering and growing of functional tissue substitutes in vitro for implantation in vivo as a biological replacement for damaged or diseased tissues and organs. Our vision and long-term goal is to combine and expand our existing statewide expertise in developmental biology, adult stem cell technology, and tissue engineering into a center focused on regenerative medicine. 2003-04 Funding: $6 Million	

Institution	2002-03 Project Title/Description	2003-04 Project Title/Description
USC & MUSC	SC Brain Imaging Center of Excellence (4 endowed chairs) One of the last remaining frontiers in science and medicine is to understand how the human brain works, both in health and disease. Central to this exploding area of science are new non-invasive tools for imaging the brain. The main area of rapid development in this area involves magnetic resonance imaging, or MRI. Given the great increase in the ability to research and investigate the living human brain, there is widespread expectation that intervention technologies to improve the function of the damaged or even the normal brain will become possible. 2002-03 Funding: $5 Million	
MUSC & USC		Translational Cancer Therapeutics (2 endowed chairs) MUSC will focus on development of new drugs and testing their activities and mechanisms of resistance in cell lines; USC will utilize mouse models that are predisposed to cancer to study the impact of gene misregulation (over-expression, deficiencies) and therapeutic agents on tumor development in a whole animal system. 2003-04 Funding: $5Million